AMENDMENTS TO THE CLAIMS

Claims 1-18 canceled.

19. (New) A powder heat treatment process characterized by subjecting fine carbon fibers to heat treatment at a temperature of 800°C or higher under an inert gas atmosphere or a hydrogen gas atmosphere in the form of powder taken out from a reaction furnace for producing the fine carbon fibers without filling them into a specific vessel or compaction-molding them; and said process further characterized by comprising steps in which 1) volatile components stuck to the fine carbon fibers are vaporized at a temperature of 800 to 1500°C and in which 2) they are then carbonized at a temperature of 1300 to 3000°C.

20. (New) A powder heat treatment process characterized by subjecting fine carbon fibers to heat treatment at a temperature of 800°C or higher under an inert gas atmosphere or a hydrogen gas atmosphere after compressing and crushing the fine carbon fibers to turn them into amorphous powder; and said process further characterized by comprising steps in which 1) volatile components stuck to the fine carbon fibers are vaporized at a temperature of 800 to 1500°C and in which 2) they are then carbonized at a temperature of 1300 to 3000°C.

21. (New) The powder heat treatment process as described in claim 20, wherein the powder after crushing has a bulk density of 15 to 35 kg/m^3.

22. (New) Powder heat treatment equipment characterized by installing a heating furnace for heating fine carbon fibers at a temperature of 800°C or higher under an inert gas atmosphere or a hydrogen gas atmosphere in the form of powder taken out from a reaction furnace for producing the fine carbon fibers without filling them into a specific vessel or compaction-molding them, wherein the heating furnace is partitioned by push-in plates for the fine carbon fibers or stirring devices in the furnace; a surrounding gas-discharging port is provided in a part close to the charging port for the fine carbon fiber powder out of compartments partitioned by the above plates or devices; and the gas-feeding port is provided in a part close to the discharging port for the above powder, and wherein in the heating furnace, a gas storing tank for giving pressure fluctuation to the inside of the heating furnace is installed immediately before or immediately after the discharging port for the fine carbon fiber powder; said equipment further characterized by providing a surrounding gas-discharging port in a part close to a charging port for fine carbon fiber powder in a heating furnace and providing a surrounding gas-feeding port in a part close to a discharging port for the fine carbon fiber powder; said equipment further characterized by comprising an openable and closable valve or plate for giving pressure fluctuation to the heating furnace from the gas storing tank described above; and said equipment further characterized by installing a charging device for charging the fine carbon fiber to the heating furnace described above, a surrounding gas-feeding device for feeding an inert gas or a hydrogen gas to the heating furnace, a controlling device for controlling flow of the powder in the inside of the heating furnace, a collecting device for collecting the fine carbon fibers from the heating furnace and a trapping device for trapping carried components contained in a waste gas coming from the heating furnace.

23. (New) Powder heat treatment equipment characterized by installing a heating furnace for heating fine carbon fibers at a temperature of 800°C or higher under an inert gas atmosphere or a hydrogen gas atmosphere after compressing and crushing the fine carbon fibers to turn them into amorphous powder, wherein the heating furnace is partitioned by push-in plates for the fine carbon fibers or stirring devices in the furnace; a surrounding gas-discharging port is provided in a part close to the charging port for the fine carbon fiber powder out of compartments partitioned by the above plates or devices; and the gas-feeding port is provided in a part close to the discharging port for the above powder, and wherein in the heating furnace, a gas storing tank for giving pressure fluctuation to the inside of the heating furnace is installed immediately before or immediately after the discharging port for the fine carbon fiber powder; said equipment further characterized by providing a surrounding gas-discharging port in a part close to a charging port for fine carbon fiber powder in a heating furnace and providing a surrounding gas-feeding port in a part close to a discharging port for the fine carbon fiber powder; said equipment further characterized by comprising an openable and closable valve or plate for giving pressure fluctuation to the heating furnace from the gas storing tank described above; and said equipment further characterized by installing a charging device for charging the fine carbon fiber to the heating furnace described above, a surrounding gas-feeding device for feeding an inert gas or a hydrogen gas to the heating furnace, a controlling device for controlling flow of the powder in the inside of the heating furnace, a collecting device for collecting the fine carbon fibers from the heating furnace and a trapping device for trapping carried components contained in a waste gas coming from the heating furnace.

24. (New) A powder heat treatment equipment, wherein it is installed a heating furnace for subjecting fine carbon fibers charged to heat treatment at a temperature of 800°C or higher under an inert gas atmosphere or a hydrogen gas atmosphere; the heating furnace is a tube or cylinder extended to a prescribed direction; and the extended direction forms an angle of 0 degree or more to 90 degrees with a horizontal face.

25. (New) The powder heat treatment equipment as described in claim 22, wherein the fine carbon fibers are continuously transferred in the inside of the heating furnace with flowing by virtue of gravity.

26. (New) The powder heat treatment equipment as described in claim 23, wherein the fine carbon fibers are continuously transferred in the inside of the heating furnace with flowing by virtue of gravity.

27. (New) The powder heat treatment equipment as described in claim 22, wherein the heating furnace described above is equipped with a push-in device driven by reciprocating motion for the fine carbon fibers and a shutting plate for the furnace.

28. (New) The powder heat treatment equipment as described in claim 23, wherein the heating furnace described above is equipped with a push-in device driven by reciprocating motion for the fine carbon fibers and a shutting plate for the furnace.

29. (New) The powder heat treatment equipment as described in claim 24, wherein the heating furnace described above is equipped with a push-in device driven by reciprocating motion for the fine carbon fibers and a shutting plate for the furnace.

30. (New) The powder heat treatment equipment as described in claim 22, wherein the heating furnace described above is a lateral furnace which is horizontally or almost horizontally disposed; plural push-in plates which do not completely shut up the inner wall of the heating furnace are disposed on a driving shaft mounted so as to pass through the center of the furnace; and the driving shaft rotates and reciprocates in a horizontal direction, whereby the flow of the powder is controlled.

31. (New) The powder heat treatment equipment as described in claim 23, wherein the heating furnace described above is a lateral furnace which is horizontally or almost horizontally disposed; plural push-in plates which do not completely shut up the inner wall of the heating furnace are disposed on a driving shaft mounted so as to pass through the center of the furnace; and the driving shaft rotates and reciprocates in a horizontal direction, whereby the flow of the powder is controlled.

32. (New) The powder heat treatment equipment as described in claim 24, wherein the heating furnace described above is a lateral furnace which is horizontally or almost horizontally disposed; plural push-in plates which do not completely shut up the inner wall of the heating furnace are disposed on a driving shaft mounted so as to pass through the center of the furnace;

and the driving shaft rotates and reciprocates in a horizontal direction, whereby the flow of the powder is controlled.

33. (New) The powder heat treatment equipment as described in claim 30, wherein the fine carbon fibers are transferred semi-batchwise or continuously.

34. (New) The powder heat treatment equipment as described in claim 31, wherein the fine carbon fibers are transferred semi-batchwise or continuously.

35. (New) The powder heat treatment equipment as described in claim 32, wherein the fine carbon fibers are transferred semi-batchwise or continuously.

36. (New) The powder heat treatment equipment as described in claim 33, wherein the fine carbon fibers to be subjected to heat treatment have an average diameter of 0.5 nm to 1 μ m and an apparent density of 100 kg/m^3 or less.

37. (New) The powder heat treatment equipment as described in claim 34, wherein the fine carbon fibers to be subjected to heat treatment have an average diameter of 0.5 nm to 1 μ m and an apparent density of 100 kg/m^3 or less.

38. (New) The powder heat treatment equipment as described in claim 35, wherein the fine carbon fibers to be subjected to heat treatment have an average diameter of 0.5 nm to 1 μ m and

an apparent density of 100 kg/m^3 or less.

39. (New) The powder heat treatment equipment as described in claim 36, wherein the fine carbon fibers to be subjected to heat treatment comprise single-walled carbon nanotubes and/or multiwalled carbon nanotubes in which the fibers have an average diameter of 0.5 nm to 1 μ m and an apparent density of 100 kg/m^3 or less.

40. (New) The powder heat treatment equipment as described in claim 37, wherein the fine carbon fibers to be subjected to heat treatment comprise single-walled carbon nanotubes and/or multiwalled carbon nanotubes in which the fibers have an average diameter of 0.5 nm to 1 μ m and an apparent density of 100 kg/m^3 or less.

41. (New) The powder heat treatment equipment as described in claim 38, wherein the fine carbon fibers to be subjected to heat treatment comprise single-walled carbon nanotubes and/or multiwalled carbon nanotubes in which the fibers have an average diameter of 0.5 nm to 1 μ m and an apparent density of 100 kg/m^3 or less.